

disengage the contacts 253 and 254. The operating parts of the machine are then in position to receive the next signal and print the corresponding character.

5 A wire 311 is connected to one of the front contacts of the relay  $U^5$ , extends through the coils of the magnet  $W^9$  and to the switch arm  $d^2$ . A wire 312 connected to the other front contact of the relay  $U^5$  extends through the coil of locking magnet  $W^{10}$  and is connected  
10 preferably through a resistance to the wire 296.

When it is desired to return the carriage to its starting point and to rotate the paper  
15 platen for the commencement of a new line, an impulse of proper strength and polarity is transmitted over the line to energize the relay  $U^5$  and close a circuit through the wire 311 as follows: from local battery, wire 256,  
20 wire 268, armature  $w^5$ , wire 311, through the magnet  $W^9$  to the switch arm  $d^2$ , through a wire 313 connected to the switch arm to brush 205, thence by the conducting strip  $p$  and wire 314 to the line-space magnet  $O$ ,  
25 thence by wire 315 to the conducting strip  $p'$ , brush 206, wires 316, 295 and 296 through the magnet 297, wires 298 and 257 back to the local generator or battery, so that the carriage platen is rotated one step. At the same  
30 time a local circuit is closed from the switch arm  $d^2$  by a wire 317, through the carriage-release magnet  $L$  and by wires 318 and 296 through the magnet 297 and wires 298 and 257 as before so that the rod  $M$  is shifted to  
35 release the feed pawls and permit the carriage to be returned to the starting point by its spring.

If it is desired to operate the line-space mechanism alone, two line impulses of proper  
40 strength and polarity are transmitted over the line, the first sufficing to operate the relay  $U^2$  and shift the switch  $d$  so that the contact between switch arm  $d^2$  and the terminal of wire 317 is broken. The second impulse  
45 then operates relay  $U^5$  and closes the circuit as before through the line-space magnet  $O$  but does not close the circuit through the carriage-release magnet  $L$ . In this instance and in fact whenever the magnet  $O$  is energized a  
50 branch of the local circuit is closed by wires 316 and 229 through the magnet 300 and by wire 284 to the return wire 257 so that the switch 289 is shifted to break the circuit through the switch-turning magnets at this  
55 point in the manner previously described in connection with the operation of the type bar magnets  $D$ . The carriage release and line-space magnets may also be actuated by transmitting an impulse over the line circuit  
60 of the required strength and polarity to close a circuit as follows: from local circuit, wire 256, wire 258, armature  $w^5$ , wire 312, through the relay  $W^{10}$ , by wires 296 and 318, through carriage-release magnet  $L$ , by wire 317 to  
65 switch arm  $d^2$  and thence by wire 313 to the

line-space magnet  $O$  as before. At the same time a branch circuit will be closed by wire 298, through the magnet 297 and it will be noted that whenever the relay  $U^5$  is operated,  
70 a circuit is closed through the magnet 297, so that the circuit will be closed as previously described, through the ribbon-shifting mechanism  $Q$  and so that the arm 304 on the ribbon shifter is actuated to open the locking  
75 shunt circuit at the unlocking switch 298 and permit the parts to return to normal position. The locking magnets  $W^9$  and  $W^{10}$  cooperate, in the manner previously described with reference to the other locking magnets, with the centrally pivoted armature  $w^5$  which is  
80 adapted to engage, when shifted in opposite directions, with a pair of contacts 311' and 312' with the wires 311 and 312 respectively.

If it is desired to move the carriage one step in letter-space direction without print-  
85 ing a character in order to properly provide space between the words of a message, two impulses of proper strength and polarity are transmitted over the line, the first of which operates to shift the switch  $d$  to one side and the second of which energizes the relay  $U^5$   
90 to close the circuit through the wire 312 and through the magnet 297. In this instance the circuit is not closed through the carriage-release magnet  $L$  since the terminal of the  
95 wire 317 connected thereto is not in engagement with the arm  $d$  of the switch. The operation of the magnet 297 thus energized closes the circuit through the ribbon-shifting magnet  $Q$  and the shifter in its operation, as  
100 previously described, brings the contacts 253 and 254 into engagement so that the current passes through the letter-space magnet  $K'$  and the carriage is spaced one step.

It will be understood of course, that where  
105 a signal is composed of or represented by two or more impulses, the latter will be transmitted in such order that two or more of the relays  $U$  will be operated in numerical order, relay  $U'$  responding to the weakest impulses  
110 and relay  $U^5$  to the strongest. Preferably, a condenser 319 and an inductive resistance 320 are connected in series to each side of the set of relays  $U$  so as to prevent sparking between their armatures and contacts. Other  
115 condensers 321 may be employed if desired, to prevent sparking between the make-and-break contacts of other parts of the apparatus.

It is obvious that numerous changes can be  
120 made in the detail of structure and arrangement of circuits without departure from the essentials of the invention.

Having described my invention what I claim as new and desire to secure by Letters  
125 Patent is:—

1. In printing telegraphs, the combination with a carriage for sustaining the paper to be printed, of means for transversely shifting  
130 said carriage comprising a shifter connected